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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/995,328	11/27/2001	Ralf Bertram	Mo-6855/HR-285	9683

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EXAMINER

ZUCKER, PAUL A

ART UNIT	PAPER NUMBER
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1621

DATE MAILED: 12/02/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Applicati n No.

09/995,328

Applicant(s)

BERTRAM ET AL.

Examin r

Paul A. Zucker

Art Unit

1621

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 September 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 3,4 and 6-9 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 3,4 and 6-9 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Current Status

1. This action is responsive to Applicants' amendment of 17 September 2002 in Paper No 6.
2. Receipt and entry of Applicants' amendment is acknowledged.
3. Applicant's cancellation of claims 1, 2 and 5 is acknowledged.
4. Claims 3, 4 and 6-9 remain pending.
5. The objection to the specification set forth in paragraph 1 of the previous Office Action in Paper No 4 is withdrawn in response to Applicants' remark's.
6. The rejection under 35 USC § 103 set forth in paragraph 2 of the previous Office Action in Paper No 4 is withdrawn in view of Applicants' cancellation of claims 1 and 2.

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

7. Claims 1 -9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pelzer et al (US 5,585,091 12-1996) and further in view of Wang et al (Paper American Chemical Society, 220th, POLY-416, 03-2000) and further in view of Heywang et al (US 5,473,079 12-1995).

Instantly claimed is a process for the synthesis of phenylene-bis-benzimidazole-tetrasulfonic acid disodium salt and its subsequent purification.

Art Unit: 1621

Pelzer teaches (Column 17, lines 28-57) a process for the synthesis of phenylene-bis-benzimidazole-tetrasulfonic acid disodium salt in which o-phenylenediamine is reacted with terephthalic acid, chlorosulfonic acid and concentrated sulfuric acid. Pelzer further teaches (Column 17, lines 38-40) a solution of the product of the reaction in water at 80 °C and treatment with activated carbon with heating. The teaching of heating encompasses the instant claimed temperature ranges since a range above room temperature to less than boiling is assumed. The instantly claimed repetition of the treatment with activated charcoal is obvious over Pelzer's teaching of the first treatment since it would require only routine experimentation by one of ordinary skill in the art to determine whether the first treatment was incompletely successful in the removal of susceptible impurities. Pelzer additionally teaches (Column 17, lines 38-40) the formation of the sodium salt via treatment with sodium hydroxide solution. Pelzer further teaches (Column 17, lines 40-41) precipitation of the product by acidification with sulfuric acid. Pelzer also suggests (Column 15, line 24) the equivalence of sulfuric and phosphoric acids in his process (Cf. instant claim 9). Pelzer teaches that a product is obtained that is 99% pure contaminated only by 1% of the trisulfonic acid.

Pelzer further teaches reaction times of 30 minutes at 180 °C while the instant process claims reaction times of 10-15 hours.

It would, however, have been obvious to one of ordinary skill in the art to modify the process of Pelzer by extending the reaction time to complete the sulfonation of the

product that Pelzer teaches contains 1% of the product of incomplete sulfonation. The instantly claimed process is therefore obvious over the teaching of Pelzer.

Pelzer also does not teach the use of sodium chloride in the neutralization/precipitation step. The instantly claimed process claims the use of sodium chloride to precipitate the disodium salt. The Examiner notes that the open “comprising” language allows the use of sodium hydroxide as taught by Pelzer as well.

Wang , however, teaches (Abstract, lines 1-7) the sulfonation of aromatic compounds and generation of the corresponding sodium sulfonate salts via neutralization with a mixture of sodium chloride and sodium hydroxide.

Both Wang and Pelzer are silent with regard to acidification in the second step to pH 3 with hydrochloric acid as claimed in instant claim 8.

Heywang, however, teaches (Column 4, line 65 – column 5, line 32) a closely related process for the synthesis of 2-phenylbenzimidazole-5-sulfonic acid. Heywang further teaches (Column 4, line 65 – column 5, line 32) the acidification to pH 3 with hydrochloric acid to produce the final product.

Thus the instantly claimed process would have been obvious to one of ordinary skill in the art. The motivation would have been to create an improved process for the production of a commercially important sunscreen component. The instant process corresponds to the process of Pelzer modified to improve the recovery of the product sodium sulfonate salt as suggested by the teachings of Wang and Heywang. The expectation for success have been high because of the closely related chemistry shared by the references.

Examiner's Response to Applicants' Arguments with Regard to This Rejection

8. Applicants have put forth several arguments with regard to this rejection. The Examiner responds to these below:

- a. Applicants request that the Examiner cite a reference showing that it is well known in that art that extending the reaction time by over 200% would produce a sulfonate salt of high purity. The Examiner responds that citation of a reference other than Pelzer is unnecessary since Pelzer already teaches such a process. There is nothing in Pelzer to lead one ordinary skill in the art to expect a poorer result with extended reaction time.
- b. Applicants argue that Pelzer does not teach a sulfonation reaction where the reaction time is at least 10 hours. To this the Examiner responds with two comments:
 - i. One of ordinary skill in the art upon detecting incomplete reaction would routinely extend the reaction time until either completion or no further change is noted.

- ii. The time required for reaction is well known to depend on the temperature of reaction. Lower temperatures lead to longer reaction times. This appears to apply to the instant case. Pelzer conducts the reaction at 180°C and the instant specification discloses (Page 5, lines 16-24) temperatures of 110°C-120°C. One of ordinary skill in the art routinely adjusts, without undue experimentation, the parameters of time and temperature during the optimization of a process. These limitations cannot, therefore, in the absence of surprising results, confer patentability over an old process.
- c. Applicants' argue that Wang teaches the production of a different sulfonate salt. The Examiner agrees but points out that both the compound taught by Wang and the instant compounds are sulfonate salts whose sulfonate group would be expected to dominate their solubility and purification behavior. Application of the teachings of Wang is therefore appropriate here.
- d. Applicants further argue that Wang does not teach an extended reaction time. The Examiner agrees but points out that Wang is not relied upon for such teaching.
- e. Applicants argue that Wang does not teach the complicated purification process of the instant invention. The Examiner agrees. The Examiner further points out that it is the combination of references which teaches the instant process. Wang teaches only one step of the purification process.

- f. Applicants argue that since the combination of Pelzer and Wang do not teach the claimed invention the rejection should be withdrawn. The Examiner disagrees since their combination with Heywang does teach the present invention.
- g. Applicants argue that Heywang teaches a different compound. The Examiner agrees but points out, as in the case with Wang, that the same class of compounds is taught.
- h. Applicants further argue that Heywang teaches a single step purification process and therefore teaches away from the instant multistep process. The Examiner disagrees and points out that it is obvious to combine known purification steps having a common intended purpose (in the instant case production of pure sulfonates). The order of application of those steps, in the absence of surprising results, cannot confer patentability over an old process.

Applicant's arguments filed 17 September 2002 have been fully considered but they are not persuasive for the reasons discussed above.

Information Disclosure Statement

- 9. Applicant's Reference AL did not appear to be relevant to the issues of this application. The publication number appears however to correspond to a typographic error of a priority document for Pelzer et al (US 5,585,091 12-1996) already cited in the prosecution of this Application.

Conclusion

10. Claims 3, 4 and 6-9 remain pending. Claims 3, 4 and 6-9 are rejected.

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Paul A. Zucker whose telephone number is 703-306-0512. The examiner can normally be reached on Monday-Friday 7:00-3:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Johann R. Richter can be reached on 703-308-4532. The fax phone numbers for the organization where this application or proceeding is assigned are


Art Unit: 1621

703-308-4556 for regular communications and 703-308-4556 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-1235.

Paul A. Zucker
Patent Examiner
Technology Center 1600

November 25, 2002



Johann Richter, Ph.D., Esq.
Supervisory Patent Examiner
Technology Center 1600